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| APPLICATION NO.  | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 10/658,828   | 09/09/2003  | Scott D. Garner      | H1799-00210         | 2854             |
| 7590   | 03/09/2004  |                      | EXAMINER            |                  |
| SAMUEL W. APICELLI<br>DUANE MORRIS LLP<br>305 NORTH FRONT STREET<br>P.O. BOX 1003<br>HARRISBURG, PA 17108-1003 |             |                      | NGUYEN, CHAU N      |                  |
|  |             |                      | ART UNIT            | PAPER NUMBER     |
|  |             |                      | 2831                |                  |
| DATE MAILED: 03/09/2004  |             |                      |                     |                  |

Please find below and/or attached an Office communication concerning this application or proceeding.

(1)

|                              |                           |                  |
|------------------------------|---------------------------|------------------|
| <b>Office Action Summary</b> | Application No.           | Applicant(s)     |
|                              | 10/658,828                | GARNER, SCOTT D. |
|                              | Examiner<br>Chau N Nguyen | Art Unit<br>2831 |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM  
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) Responsive to communication(s) filed on \_\_\_\_.
- 2a) This action is **FINAL**.                            2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) Claim(s) 1-6,9-15,17-21,24 and 25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_ is/are allowed.
- 6) Claim(s) 1-6,9-15,17-21,24 and 25 is/are rejected.
- 7) Claim(s) \_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) All    b) Some \* c) None of:
  1. Certified copies of the priority documents have been received.
  2. Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

|   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | Paper No(s)/Mail Date. ____ .   |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>1/5/04</u> . | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
|   | 6) <input type="checkbox"/> Other: ____ .                                   |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by IBM Technical Disclosure Bulletin (IBM).

IBM discloses a thermal energy management system comprising a heat spreading device (101) which is operatively engaged with at least one heat generating component (100), and a thermal bus (102) that is operatively engaged with the heat spreading device so as to transport thermal energy from the heat generating device to a heat sink (104).

3. Claims 1, 2, 9, 12 and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Grunes et al. (4,393,663).

Grunes et al. discloses a thermal energy management system comprising a heat spreading device (12) which is operatively engaged with at least one heat

generating component (16), and a thermal bus (18) that is operatively engaged with the heat spreading device so as to transport thermal energy from the heat generating device to a heat sink (14) (re claims 1 and 17). Grunes et al. also discloses the heat spreading device comprising a heat pipe (Figs 2 and 3) and the thermal bus comprising a loop thermosyphon (re claim 2), the thermal bus comprising at least one loop thermosyphon that is thermally engaged with the heat spreading device so as to bus thermal energy to a thermal energy sink (re claim 9), and the loop thermosyphon comprising a condensing portion positioned in spaced away relation to an evaporator portion (re claim 12).

4. Claims 17-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Anderson et al. (5,761,037).

Anderson et al. discloses a thermal energy management system comprising a heat pipe (101-104) heat spreader that is thermally engaged with at least one heat generating component (30), and an evaporator plate (105) positioned between a portion of the heat pipe spreader and an evaporator portion of a loop thermosyphon so as to transport thermal energy from the heat pipe to a heat sink (re claim 17). Anderson et al. also discloses the evaporator plate providing a physical and thermal interface between a top wall (101) of the heat pipe and the evaporator portion of

the loop thermosyphon (re claim 18), the evaporator plate being formed from a substantially uniform thickness sheet of a thermally conductive material that is sized and shaped to cover portion of the top wall (re claim 19), and at least one groove (106) formed in a top surface of the evaporator plate to receive and cradle the evaporator portion of the loop thermosyphon (re claim 20).

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grunes et al. in view of Obtain et al. (JP61-250491).

Claims 3 and 4 additionally recite a second loop thermosyphon operatively engaged with the first thermal bus. Obtain et al. discloses a system comprising a second loop thermosyphon being thermally engaged with a first thermal bus (Figs 1-4). It would have been obvious to one skilled in the art to apply the teaching of Obtain et al. in the system of Grunes et al. to provide the heat pipe with a plurality of outgoing and incoming sections of heat.

7. Claims 5, 6 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grunes et al.

Re claims 5 and 24, it would have been obvious to one skilled in the art to size and shape the planar (see Grunes et al. Figs 2 and 3) heat pipe of Grunes et al. to have an area larger than the area of the heat generating device to spread out more heat quickly since a larger area would spread more heat out is known in the art. Re claim 6, it would have been obvious to one skilled in the art to modify the planar heat pipe of Grunes et al. to have two substantially uniform thickness sheets since it is known in the art to form a pipe by attaching two substantially uniform thickness sheets together.

8. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Anderson et al.

Anderson et al. discloses a thermal energy management system comprising a heat pipe (101-104) heat spreader that is thermally engaged with at least one heat generating component (30), and an evaporator plate (the plate having groove 107)) positioned between a portion of the heat pipe spreader and an evaporator portion of a first loop thermosyphon so as to transport thermal energy from the heat pipe to a

heat sink. Anderson et al. also discloses a second evaporator plate (the plate opposite the plate having groove 107) positioned adjacent the condensing portion of the first loop thermosyphon. Anderson et al. does not disclose an evaporator portion of a second loop thermosyphon being operatively engaged with the second evaporator plate. However, it would have been obvious to one skilled in the art to provide an evaporator portion of a second loop thermosyphon engaged with the second evaporator plate of Anderson et al. to provide a plurality of outgoing sections of heat since it has been held that merely duplicating the essential working part of a device involves only routine skill in the art. St. Regis paper Co. v. Bemis Co., 193 USPQ 8.

9. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Anderson et al. in view of Obtain et al.

Anderson et al. discloses the invention substantially as claimed except for thermally coupling a condensing portion of the first loop thermosyphon to an evaporator portion of a second loop thermosyphon. Obtain et al. discloses a system comprising a condensing portion of a first loop thermosyphon being thermally engaged with an evaporator portion of a second loop thermosyphon (Figs 1-4). It would have been obvious to one skilled in the art to apply the teaching of

Obtain et al. in the system of Anderson et al. to provide the heat pipe with a plurality of outgoing and incoming sections of heat.

10. Claims 10, 11, 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grunes et al. in view of Garner et al. (5,822,187).

Claim 10 additionally recites an integrally formed wicking layer disposed on the surface of the tube. Garner et al. discloses a heat management system comprising a thermal bus (26,28) having an integrally formed wicking layer which is sintered copper powder, has a thickness of 0.5 mm (re claim 11) and disposed on the surface of the tube. It would have been obvious to one skilled in the art to provide a wicking layer as taught by Garner et al. in the thermal bus of Grunes et al. to improve the heat evaporation.

Re claims 13 and 14, Garner et al. discloses a portion of a thermal bus being arranged in intimate thermal contact with a wall of a chassis, wherein the thermal bus is positioned by simple fastening system so that it may be disassembled from an electronic system. It would have been obvious to one skilled in the art to apply the teaching of Garner et al. in the heat management system of Grunes et al. to secure the thermal bus to an electronic system.

11. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Grunes et al. in view of Garner et al. as applied to claim 13 above, and further in view of Obtain et al.

Claim 15 additionally recites a second thermal bus positioned adjacent to a condensing portion of the first thermal bus. Obtain et al. discloses a heat management system comprising a second thermal bus positioned adjacent to a condensing portion of a first thermal bus (Figs 1-4). It would have been obvious to one skilled in the art to apply the teaching of Obtain et al. in the system of Grunes et al. to provide a plurality of outgoing and incoming sections of heat.

### ***Communication***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chau N Nguyen whose telephone number is 571-272-1980. The examiner can normally be reached on Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dean Reichard can be reached on 571-272-2800 ext 31. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Chau N. Nguyen  
Primary Examiner  
Art Unit 2831